REMARKS

Claims 35-48 are pending in this application. Claims 35-38, 42 and 43 have been amended. No new matter has been introduced.

The drawings stand objected to as "reference characters 654 . . . and 600 . . . have both been used to designate the same processor." (August 23, 2005 Office Action at 2). The drawings also stand objected to as "they do not include the . . . reference sign . . . mentioned in reference to a conductor: 131." (August 23, 2005 Office Action at 3). Paragraph [0047] of the specification has been amended to correct the reference to the processor 644. Applicant also submits that conductor 131 is illustrated in Figure 2.

Claims 35, 36, 38 and 40 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Zhao et al. (U.S. Patent No. 6,339,248) ("Zhao"). This rejection is respectfully traversed.

The claimed invention relates to an imager pixel. As such, amended independent claim 35 recites a "pixel" comprising "a substrate" and "a photoconversion device fabricated in said substrate, said device having a charge collection region." Amended independent claim 35 also recites "a reset region . . . coupled to said charge collection region, said reset region being configured to apply a reset charge to said charge collection region in response to a pulsed reset signal applied to said reset region."

Zhao relates to a "photodiode with an optimized floating P+ region for a CMOS image sensor." (Abstract). According to Zhao, "[T]he photodiode is constructed with a P+/Nwell/Psub structure" so that "[T]he Nwell/Psub junction of the photodiode acts as a deep junction photodiode which offers high sensitivity." (Abstract). Zhao also teaches that, "[U]nlike a traditional pinned photodiode structure, the P+ region in the

present invention is not connected to the Pwell or Psub regions, thus making the P+ region floating." (Abstract).

Zhao does not anticipate the subject matter of claims 35, 36, 38 and 40. Zhao fails to disclose, teach or suggest "a reset region . . . configured to apply a reset charge to said charge collection region in response to a pulsed reset signal applied to said reset region," as amended independent claim 35 recites. Zhao teaches that a high concentration doping is used to form N+ regions 123 and 125. (Col. 4, lines 58-61). However, N+ regions 123 and 125 of Zhao are "source and drain of the reset transistor" (col. 4, lines 64-65), and not "a reset region . . . coupled to said charge collection region" and "being configured to apply a reset charge to said charge collection region in response to a pulsed reset signal," as in the claimed invention. For at least these reasons, Zhao fails to anticipate the subject matter of claims 35, 36, 38 and 40, and withdrawal of the rejection of these claims is respectfully requested.

Claims 37, 42, 43 and 45 stand rejected under 35 U.S.C. § 103 as being unpatentable over Zhao in view of Chen et al. (U.S. Patent No. 6,392,263) ("Chen"). This rejection is respectfully traversed.

Amended independent claim 42 recites a "pixel for use in an imaging device, said pixel consisting essentially of: a charge collection region," "a reset region . . . adjacent said charge collection region for periodically resetting a charge level of said charge collection region in response to a reset signal applied to said reset region" and "a source follower transistor for outputting a signal representing charge collected in said charge collection region." Amended independent claim 42 also recites "a row select transistor for selectively outputting a signal from said source follower transistor" and "a capacitor in electrical communication with said reset region and said source follower transistor for storing charge collected in said charge collection region."

Chen relates to a "densely integrated pixel, fabricated by CMOS technology" that comprises "a photodiode formed by a n-well, with cathode, surrounded by a p-well; a reset MOS transistor formed such that its polysilicon gate is positioned, for diode control, across the junction formed by p-well and n-well regions, and its source is merged with the photodiode cathode." (Abstract). Chen also teaches "a sensing MOS transistor formed such that its source is combined with the drain of the reset transistor and its gate is electrically connected to the source of the reset transistor." (Abstract).

The subject matter of claims 37, 42, 43 and 45 would not have been obvious over Zhao in view of Chen. Specifically, the August 23, 2005 Office Action fails to establish a *prima facie* case of obviousness. Courts have generally recognized that a showing of a *prima facie* case of obviousness necessitates three requirements: (i) some suggestion or motivation, either in the references themselves or in the knowledge of a person of ordinary skill in the art, to modify the reference or combine the reference teachings; (ii) a reasonable expectation of success; and (iii) the prior art references must teach or suggest all claim limitations. See e.g., In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Rouffet, 149 F.3d 1350, 1355 (Fed. Cir. 1998); Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573 (Fed. Cir. 1996).

In the present case, Zhao and Chen, considered alone or in combination, fail to disclose, teach or suggest all limitations of independent claims 35 and 42. Zhao and Chen, alone or in combination, do not disclose, teach or suggest "a reset region of a first conductivity type fabricated in said substrate" and "being configured to apply a reset charge to said charge collection region in response to a pulsed reset signal applied to said reset region," as amended independent claim 35 recites. Zhao teaches that N+ regions 123 (which would arguably correspond to the "reset region" of the claimed invention) is a "source and drain of the reset transistor" (col. 4, lines 64-65), and not "a reset region . . . coupled to said charge collection region, said reset region being

configured to apply a reset charge to said charge collection region in response to a pulsed reset signal applied to said reset region," as in the claimed invention.

Similarly, Chen is silent about "a reset region," much less about "a reset region . . . fabricated in said substrate and coupled to said charge collection region, said reset region being configured to apply a reset charge to said charge collection region in response to a pulsed reset signal applied to said reset region," as in the claimed invention. Chen teaches the formation of a reset transistor 101a coupled to photodiode 103 so that the polysilicon gate of the transistor is positioned across the junction formed by p-well and n-well regions, and not a reset region having the specific characteristics recited in claim 35.

Zhao and Chen, alone or in combination, also fail to disclose, teach or suggest all limitations of amended independent claim 42. Zhao is silent about a "pixel . . . consisting essentially of: a charge collection region," "a reset region . . . adjacent said charge collection region for periodically resetting a charge level of said charge collection region in response to a reset signal applied to said reset region," "a source follower transistor," "a row select transistor" and "a capacitor in electrical communication with said reset region and said source follower transistor," as claim 42 recites. As noted above, Zhao and Chen fail to disclose, teach or suggest "a reset region . . . adjacent said charge collection region for periodically resetting a charge level of said charge collection region in response to a reset signal applied to said reset region," as in the claimed invention. In addition, none of the references discloses, teaches or suggests a "capacitor in electrical communication with said reset region and said source follower transistor," as claim 42 recites.

Applicant points our that claim 42 does not recite the fully open term "comprising," but rather the narrower phrase "consisting essentially of" to better reflect

the patentable aspects of the invention. Applicant further notes that courts have consistently held that "[B]y using the term 'consisting essentially of,' the drafter signals that the invention necessarily includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention. A 'consisting essentially of' claim occupies a middle ground between closed claims that are written in a 'consisting of' format and fully open claims that are drafted in a 'comprising' format." Regents of Univ. of Calif. V. Eli Lilly & Co., 119 F.3d 1559, 1573, 43 U.S.P.Q.2d 1398, 1410 (Fed. Cir. 1997). Since the limitations of claim 42 are not described by either Zhao or Chen, the subject matter of claims 42, 43 and 45 would not have been obvious under 35 U.S.C. § 103.

For at least the reasons above, the Office Action fails to establish a *prima facie* case of obviousness, and withdrawal of the rejection of claims 37, 42, 43 and 45 is also respectfully requested.

Claim 39 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhao in view of Kochi et al. (U.S. Patent No. 6,670,990) ("Kochi"). This rejection is respectfully traversed.

Claim 39 depends on claim 38 and ultimately on claim 35. Claim 39 recites that the pulsed voltage source "is coupled to one terminal of a capacitor, the other terminal of which is coupled to said extended charge collection region."

Kochi relates to a "photoelectric conversion device having a plurality of pixel cells each of which includes a photoelectric conversion element, a field effect transistor having the gate area for storing signal charge generated by the photoelectric conversion element and the source-drain path for outputting a signal corresponding to the signal charge stored in the gate." (Abstract). Kochi also teaches "a first power supply line for

supplying electric power to the field effect transistor, and a first switch connected between the field effect transistor and the first power supply line." (Abstract).

The subject matter of claim 39 would not have been obvious over Zhao in view of Kochi. Again, the Office Action fails to establish a *prima facie* case of obviousness. Zhao and Kochi, alone or in combination, do not disclose, teach or suggest all limitations of amended independent claim 35. As noted, Zhao fails to disclose, teach or suggest "a reset region . . . coupled to said charge collection region, said reset region being configured to apply a reset charge to said charge collection region in response to a pulsed reset signal applied to said reset region," as amended independent claim 35 recites. Zhao teaches that N+ regions 123 is a "source and drain of the reset transistor" (col. 4, lines 64-65), and not "a reset region . . . coupled to said charge collection region" and "configured to apply a reset charge to said charge collection region in response to a pulsed reset signal," as in the claimed invention. Kochi is silent about any of the limitations of claim 35. Kochi does not even mention "a photoconversion device fabricated in said substrate" and "a reset region of a first conductivity type fabricated in said substrate and coupled to said charge collection region, said reset region being configured to apply a reset charge to said charge collection region," as in the claimed invention. For at least these reasons, the subject matter of claim 39 would not have been obvious over the combination of Zhao and Kochi, and withdrawal of the rejection of claim 39 is respectfully requested.

Claims 41 and 44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhao/Chen in view of Dasgupta (U.S. Patent No. 6,146,939). Claims 46-48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhao/Chen in view of Wada et al. (U.S. Patent No. 6,677,676) ("Wada"). These rejections are respectfully traversed.

Applicant notes that claim 41 depends on amended independent claim 35, and that claims 44, 46 and 48 depend on amended independent claim 42. Applicant also notes that, as detailed above, Zhao and Chen, considered alone or in combination, fail to disclose, teach or suggest all limitations of independent claims 35 and 42. Dasgupta and Wada do not correct the deficiencies of Zhao and Chen. None of Dasgupta and Wada discloses, teaches or suggests "a reset region . . . coupled to said charge collection region, said reset region being configured to apply a reset charge to said charge collection region in response to a pulsed reset signal" (claim 35) or "a reset region . . . adjacent said charge collection region for periodically resetting a charge level of said charge collection region in response to a reset signal" (claim 42). For at least these reasons, the Office Action fails again to establish a *prima facie* case of obviousness, and withdrawal of the rejection of claims 41, 44 and 46-48 is also respectfully requested.

Allowance of all pending claims is solicited.

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Respectfully submitted,

By_____

Thomas J. D'Amico
Registration No.: 28,371
Gabriela I. Coman
Registration No.: 50,515
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L Street NW
Washington, DC 20037-1526
(202) 785-9700
Attorneys for Applicant